

Gill Eapen

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CEO, **Decision Options**, LLC
Groton, CT (2001 – Now)

MBA, Finance and Economics
University of Chicago
magna cum laude, 1994

Managing Director, **Stout**
Chicago, IL (2016 – 2018)

MS, Structural Engineering
Northwestern University
magna cum laude, 1986

Vice President, **Charles River Associates**
Boston, MA (2010 – 2011)

B-Tech, Civil Engineering
Indian Institute of Technology
summa cum laude, 1985

Group Director, **Pfizer**, Inc.
New York, NY (1997 – 2000)

Executive Development
Harvard University, 2000

Manager, **Deloitte Consulting**
Dallas, TX (1994 – 1997)

CFA charter holder
2008

Senior Consultant, **Asea Brown Boveri**
Lincolnshire, IL (1986-1992)

Gill Eapen is the founder and CEO of Decision Options ®, a leader in Artificial Intelligence applications in business decision-making. Previously, he was Managing Director of Predictive Economics, at Stout. Mr. Eapen has over 30 years of experience in strategy, finance, machine learning, artificial intelligence, engineering and general management. Over the past two decades, Decision Options pioneered analytical techniques to inform and guide decisions to enhance shareholder value in companies of all sizes. Mr. Eapen has advised clients on a broad range of industries including life sciences, healthcare, energy, aerospace, high technology, pharmaceuticals, biotechnology, medical devices, manufacturing, consumer goods, financial services and legal services. Mr. Eapen has been involved in the area of computer-aided decision-making starting with his graduate thesis in 1986 at Northwestern University. Later in the 90s, his team created and implemented one of the largest predictive models to forecast and manage all resources needed to conduct worldwide R&D at Pfizer, with annual investments exceeding \$4 Billion. In 2004, he developed an artificially intelligent trading platform for a market-neutral equity fund showing consistent alpha.

Decision Options ® incorporates most of the known machine and deep learning techniques to rapidly create predictive and pattern finding models from any kind of data – structured or unstructured. It also features market-based economic valuation and risk assessment in private assets such as emerging technologies, intellectual property, know-how, facilities, contracts, data, processes, R&D, brand, and access. The technology has been used to help organizations select and design products, technologies, processes, IP and facilities, budget and manage resources and capital across a portfolio of opportunities and forecast and predict business attributes to increase revenue, reduce cost and enhance value.

Mr. Eapen is the author of two textbooks. The first book, Decision Options: The Art and Science of Making Decisions, provides the theory and practice of real options in economic valuation and investment decision-making in private assets. The second book, Flexibility: Flexible Companies for the Uncertain World is a comprehensive discussion of the structure, systems, and strategies needed for companies to survive and succeed in an increasingly uncertain world. His Blog, "Scientific Sense," and associated books are followed by people in over 150 countries from 2008. He is also a frequent speaker at conferences worldwide on subjects of strategy, innovation, economics, and analytics.

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2001– Present

Decision Options ® provides advisory services and technology for strategic and financial decision-making, portfolio management, machine & deep learning and artificial intelligence. Decision Options principals have consulted with over 4 dozen companies in many industries including pharmaceuticals, biotechnology, medical devices, aerospace, defense, hi-technology, manufacturing, oil & gas, solar & wind, fossil & nuclear power, financial services and consumer goods.

Decision Options has created patent-pending technologies for the economic valuation of private assets such as intellectual property, contracts, technologies and other assets without readily observable market prices.

Decision Options Technology (DoT), a software platform for machine and deep learning and complex option pricing in real and financial markets, utilizes simulation and dynamic programming to solve any combination of options, swaps, cash flows and technical risks. It has been used to solve a variety of valuation, predictive and decision problems in life sciences, energy, aerospace, and technology. Decision Options network of scientists include experts in all aspects of pharmaceutical R&D.

Results: Decision Options has helped create significant shareholder value in dozens of companies by aiding better decision-making including the selection and design of strategies, products & technologies, risk, portfolio management of complex combinations of real and financial assets, deal structuring among companies transacting on private assets such as ideas, technologies and other intellectual property and web services that encapsulate machine and deep learning for a plethora of predictive and pattern finding models.

Managing Director, Predictive Economics, STOUT, Chicago, IL

2016– Present

STOUT is a premier global advisory firm that specializes in Investment Banking, Valuation & Financial Opinions, and Dispute Advisory & Forensic Services. Since its inception in 1991, it has grown at a rapid pace by focusing on delivering exceptional service and building lasting relationships. Today, in addition to a powerful list of international affiliate locations, the firm has offices in Atlanta, Baltimore, Chicago, Cleveland, Dallas, Denver, Detroit, Grand Rapids, Houston, Irvine, Los Angeles, New York, Philadelphia, Tysons Corner, and Washington, D.C. STOUT serves a broad range of clients from Fortune 500 corporations to privately held companies in numerous industries and geographies around the world. Our clients and their advisors have come to rely on our premier expertise, deep industry knowledge, and unparalleled responsiveness on complex matters.

Results: Established a new service line entitled Predictive Economics, that utilizes Decision Options ® Technology with broad capabilities in machine and deep learning and economic modeling to help clients in a variety of industries make better decisions, run their businesses more efficiently and create and execute strategies to enhance shareholder value. Led the development of predictive and economic models in many industries including healthcare, legal services, and manufacturing. Developed a cohort of new clients for the firm and an entirely new revenue stream that is complementary to its current portfolio of products and services.

Decision Options ® Technology is being used to create artificially intelligent agents working on dynamic data to provide continuous decision aids for clients on a subscription basis in different industries.

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2010 - 2011

Charles River Associates is a leading global consulting firm that offers economic, financial, and business management expertise to major law firms, industries, accounting firms, and governments around the world. With proven skills in complex cases and exceptional strength in analytics, CRA consultants have provided astute guidance to clients in thousands of successful engagements. Gill Eapen led the applications of decision options framework in project selection & design, portfolio management, risk management and deal structuring with applications in diverse practice areas including life sciences, energy, environment, aerospace, manufacturing, chemicals, consumer goods and litigation.

- Provided expert analysis in a damages case of a contract breach between a government entity and a nuclear power producer
- Provided expert advice on risk management & deal structuring for a pharmaceutical company
- Analyzed a portfolio of business development deals for several years in a large pharmaceutical company to assess the efficiency of valuation and deal structuring processes.
- Provided expert advice on entering a chemicals market for an aerospace company with a new process that results in diverse by-products
- Provided expert advice on spinning off manufacturing assets in a pharmaceutical company.
- Provided expert advice on revenue forecasting for a chemicals company from an emerging platform technology with applications in diverse industries

Results: Provided advice to a variety of clients on a plethora of strategic, legal and operating questions to improve shareholder value and to defend and nourish valuable intellectual property

Group Director, Pfizer, Inc.

1997 - 2001

Member of the senior management team responsible for the financial planning of investments in global R&D spanning locations throughout the US, Europe, and Asia (\$4 billion per year).

- Set investment priorities in R&D. Led a team of professionals to create innovative analytical tools to aid decision-making in the areas of portfolio management and business development.
- Assessed business development deals for in-licensing platform technologies and candidates
- Led the budgeting and capital allocation to all R&D programs – including platform technologies, candidates in over ten different therapeutic areas, franchises, and infrastructure.
- Created policy decisions in the area of capital investments, organizational structure, incentive mechanisms, and growth targets.
- Established an internal consulting organization capable of providing solutions to operating managers in all aspects of analysis and planning including valuation, supply chain optimization, and budgeting.
- Re-engineered the budgeting process to significantly reduce manual efforts and cycle time and dramatically increase the decision and management power of the information generated.
- Developed a Monte-Carlo simulation based analytical technique for resource forecasting. Instituted productivity measurements and benchmarking among a few highly leveraged operational variables to enhance diagnostic power and forward financial planning.
- Created and implemented a new technique based on “Real Options” to value investments in technologies and early product ideas to make more optimal investment decisions.

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- Conceptualized, designed, and implemented web-based architecture for financial and operational forecasted information to help managers plan and test scenarios.
- Standardized global financial reporting by systematically breaking down the cost structure into standard expense pools with identified expense drivers. Re-engineered the process and vehicle of financial reporting, utilizing global data warehouses, and exception reporting.
- Created and implemented efficiency and productivity metrics in R&D with real-time tracking
- Developed new business models that included networked organizations of contract manufacturing and research organizations.
- Developed methodologies to optimize manufacturing plants of various sizes and efficiencies along with the features included in outsourcing contracts with suppliers
- Led the creation of an information technology infrastructure with analytical engines and web-based delivery of critical information for decision-making.

Results: Effectively managed the financial environment of hyper-growth in a large company, driven by technical expertise to enhance productivity and shareholder value. By changing the budgeting and capital allocation processes from a yearly cycle to real-time and incorporating uncertainty in the planning processes systematically, the overall effort expended in forecasting was reduced substantially and the decision-quality was enhanced. Productivity measurements have led to identification and elimination of process bottlenecks. Innovative valuation techniques helped negotiate better deal structures. Unique and innovative systems solutions to financial reporting reduced information response time by 90%. New analytical techniques helped managers venture into areas not possible before such as collaborative investments in platform technologies, cross-licensing of intellectual property and sequestered capacity in suppliers' manufacturing capacity.

Manager, Deloitte & Touche Consulting Group, Dallas, TX

1994-1997

Commodity distributor

- Created a new pricing policy and logic to create higher differentiation among customers based on price elasticity and purchase behavior and implemented a new system across 250 retail locations in the US.

Results: Increased product margins by over 5% because of the higher customer differentiation and quick access to pricing logic over the desktop.

Specialty equipment manufacturer

- Analyzed breaks in customer service and recommended an organization structure and recommended customer-focused teams instead of a conventional functional structure.

Results: Nearly eliminated customer complaints in a year.

Software Start-up

- Analyzed industry verticals to expand for a new software technology and made recommendations on prioritized industry segments for entry and timing.

Results: Profitable entry into two additional industry segments.

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Logistics optimization

- Analyzed American and European logistical network of manufacturing and distributing centers and reconfigured the network by scaling down the different types of products manufactured in the various plants for a consumer goods manufacturer.

Results: Optimized logistical system with significant impact in the overall cost structure.

Senior Engineer, Asea Brown Boveri, Lincolnshire, IL & Norcross, GA 1986–1992

- Created simulation models for dynamic analysis of power plant and transportation structures for large electric utilities in the Mid-West and the Southern part of United States.
- Marketed engineering analysis software (FEM and CFD) to aerospace and automotive clients.
- Led a team of professionals in providing consulting services in the energy, aerospace and manufacturing sectors.

Results: Created innovative methodologies for automated analysis and decisions in complex and large structures in energy and transportation. Created expert system-driven logic for automated modeling of engineering systems.

Affiliations

CFA charter holder and member of the Boston Security Analysts Society

Publications

Articles

- "A conversation on how healthcare is being transformed using artificial intelligence," SRR, April 2017
- "The future of intellectual property risk management for in-house counsel," New York Bar Daily, January 2017
- "Using analytics to improve capital budgeting process," Financial Executives International Daily, September 2016
- "Decision-making by harvesting uncertainty," SRR Journal, Fall 2016
- "Value-Based Management in Biosciences Research and Development." *Journal of Applied Corporate Finance*, 2005, Vol. 17, No. 2, pp 105-112.
- "The Accidental Real Options Practitioner." *Journal of Applied Corporate Finance*, Vol. 15, No. 2, 2002.
- "University of Maryland Roundtable on Real Options and Corporate Practice." *Journal of Applied Corporate Finance*, Vol. 15, No. 2, 2002.

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Books

"Decision Options: The Art and Science of Making Decisions." Chapman & Hall, June 1, 2009.

Although uncertainty and flexibility are important attributes that drive the value of an investment, they are seldom systematically considered in the traditional financial analysis. Through theory and case studies, Decision Options: The Art and Science of Making Decisions details how uncertainty and flexibility can be evaluated to assist in making better investment decisions in companies. Harnessing the author's own software technology, the book supplies a toolset that enables the incorporation of uncertainty and flexibility in investment decisions up front without being too complex.

In the first part of the textbook, finance theory underlying traditional techniques such as Discounted Cash Flow and financial options theory as well as the principles of modern economics – real and decision-options are presented. In the second half over 40 cases are described from life sciences, hi-technology, manufacturing, energy, and aerospace on a variety of decision modalities including the selection and design of products, processes and technologies, portfolio and risk management, valuation, licensing and external transactions. The cases illustrate the use of a software technology of the same name that allows the modeling of complex decision-problems. The company has three patents pending on the methodologies and techniques that are referred to as Decision Options ®. Operating from the cloud, the technology provides unparalleled access to a shareable platform in the enterprise that links economic modeling with the latest in machine learning to solve most decision problems in the enterprise.

"Flexibility: Flexible Companies for the Uncertain World." CRC Press, December 17, 2009.

We are in an era of high volatility and uncertain outcomes, driven by accelerating technologies, shortened product cycles, fast-changing information, an increasingly mobile workforce, more demanding customers, complex financial markets, ad-hoc public policies, and many other factors that add layers of uncertainty to all future possibilities. While most believe that good management requires better prediction of the future and better planning, Gill Eapen instead contends that the best way to manage effectively in an uncertain world is through the conscious application of flexibility - ability to absorb constantly shifting variables and adapt quickly.

The book provides a theory of the modern firm with descriptions of the structure, systems, and strategies that are necessary to survive and succeed in the complex world of interconnected technologies, companies, markets, and countries. It argues a fundamental transformation is needed in the ecosystem of business and the traditional notions of employees and managers are obsolete.

"Scientific Sense: Ideas, Opinions & Speculation," BloggingBooks, October 24, 2012

This book is a compilation of entries from the blog entitled Scientific Sense, written and maintained by Mr. Eapen from 2008 to 2012. Blog entries after 2012 are freely available to the public at www.scientificsense.com and are expected to be converted to a sequel in 2020. It has readership from over 150 countries. The topics covered include contemporary and emerging ideas in areas such as science, economics, and policy. It challenges status-quo notions and invites readers to consider alternative views to traditional thinking. It explores economic issues in a societal context and offers ideas on better designs. Often, the discussion topics include the latest news on many scientific topics providing a view from a non-expert. The blog's popularity has grown over time as the content is syndicated by other websites in many countries.

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- Presented in Real Options Conference on “Artificial Intelligence in Strategic and Financial Decision Making,” Boston, June 2017
- Presented in the Michigan CPA conference on “Machine Learning in the detection of accounting fraud in ledger data,” Detroit, May 2017
- Presented in the Healthcare Technology conference on “Artificial Intelligence in patient management in behavioral health and primary care,” Nashville, April 2017
- Presented on the use of analytics in the Financial Executives International conference, New York, NY, October 2016
- Presented on the use of analytics to improve selection, design and portfolio management decisions in life sciences, Philadelphia, September 2016
- Presented on the use of analytics in jump-starting innovation in the Chief Innovation Summit, San Francisco, June 2016
- Presented on the use of predictive and decision analytics in pharmaceutical decision-making in the pharmaceutical finance conference, Boston, March 2016
- Presented on “Value of Design Flexibility,” in the Electric Utilities Environment Conference, Phoenix, AZ, February 2013
- Presented on portfolio management of energy production assets in the Electric Utilities Environment Conference, Phoenix, AZ, February 2012
- Presented on decision-making and portfolio management practices in R&D Leaders Forum, Boston, MA, November 2011
- Presented and participated in a panel at the Hult Business School Energy Conference, July 2011
- Presented and participated in the panel discussion at the Massachusetts Institute of Technology Energy Conference, Cambridge, March 2011
- Gave a guest lecture on the valuation of real estate using decision options methodology and technology to MIT graduate students – Cambridge, April 2011
- Chaired a session on Renewable Energy in Electric Utilities Environmental Conference in Phoenix, AZ, February 4, 2011
- Led workshop on economic value-based decision-making in the 9th Lean Six Sigma for Pharmaceutical, Biotech and Medical Device Excellence, February 22, 2010, Philadelphia
- Presented at the Annual European Power Generation Summit, Czech Republic, November 30, 2009
- Led workshop on maximizing portfolio value in a time of increasingly constrained resources in Healthtech conference, Philadelphia, PA, Nov 2, 2009
- Provided a talk on Economic Valuation and Decision Making to the combined MBA class of Loyola Institute of Business Administration, Chennai, India, July 23, 2009
- Chaired a panel on "Financial Crisis, Volatility and Real Options Views" in the 13th International Conference, June 17-20, 2009, Minho, Portugal
- Led a workshop on economic value based product design for combination drugs in Healthtech conference, Cambridge, MA, June 1, 2009
- Led a workshop on "Value-based decision making in Pharmaceuticals," at IQPC conference in Philadelphia, Feb 23, 2009
- Presented on economic valuation of power generation assets and decision-making at EUEC Energy and Environment Conference in Phoenix, February 3, 2009

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- Presented on economic value-based decision-making in 7th Lean Six Sigma for Pharmaceutical, Biotech and Medical Device Excellence. February 23-25, 2009 · The Chemical Heritage Foundation Conference Center, Philadelphia, PA
- Presented on economic valuation of power generation assets and decision-making at EUEC Energy and Environment Conference in Phoenix, February 3, 2009
- Chaired session on "Practice of Risk Management" in the INFORMS annual meeting in Seattle, WA. Nov 3, 2007.
- Presented and took part in panel discussions at the 11th Annual Real Options Conference at Berkeley, CA, June 6-9, 2007
- Presented at the "Starting and Growing Biotech Ventures" conference organized by Rensselaer Polytechnic Institute, Albany, New York, October 12, 2006
- Presented at the 10th Annual Real Options Conference on applications of Real Options in R&D Manufacturing, Columbia University, June 17-20, 2006
- Presented on valuation of power plants and pollution reduction technologies in the Electric Utilities Environmental Conference in Tucson, AZ, Jan 22-25, 2006
- Presented on real asset valuation and risk management at the Institute for Operations Research and Management Science Annual Conference, San Francisco, Nov 13-17, 2005
- Presented at the annual meeting of the Society of Petroleum Engineers, Portugal, October 2005.
- Presented on deal structuring of oncology product licensing at 7th Annual ANTI-CANCER Drug Discovery & Development Summit July 12-13, 2005 - Boston
- Presented on real asset valuation in the 9th annual conference on Real Options in Paris, France, 06/23/2005.
- Presented on real asset valuation and related applications in Pharma and Biotechnology Industry Conference in Washington organized by the CFA Institute. 06/21/2005
- Presented on real asset valuation in Forum of Corporate Finance at Northwestern University, May 12, 2005
- Presented on real asset valuation and related applications in 4th Hedge Fund Analytics conference in New York. 02/24/2005
- Presented on valuation and portfolio management in Pharmaceutical Licensing and Deal Making Summit in Phoenix arranged by Strategic Research Institute, March 29-31, 2005
- Gave two lectures to Master of Science students at the University of Illinois - Dec 1, 2004
- Presented in Real Options Conference, Montreal, Canada - June 16, 2004
- Chaired Real Options conference by International Quality and Productivity Center in Lajolla, CA. Sep 28, 2003
- Chaired session on R&D Finance in the Drug Information Association Annual Meeting in San Antonio, Texas, June 8-14, 2003
- Presented in the workshop on real options in petroleum and energy in Mexico City, hosted by Petro'leos Mexicanos and Instituto Mexicano del Petro'leo, Sep 19-20, 2002
- Presented at the 6th Annual Real Options conference in Paphos, Cyprus, July 4-6 2002
- Presented at the conference on "Financial planning in pharmaceutical industry" in Mumbai, India, July 1, 2002
- Presented in the Real Options symposium at the University of Maryland, April 19, 2002
- Presented in "Creating, Measuring and Managing Value" conference in Tokyo, Japan, Feb 12, 2002